The Northwestern MILLER
MILLING PRODUCTION SECTION

# WORKSHOP ON BUILDING A NEW FLOUR MILL

**The first in a series of studies devoted to economical mill construction and machinery layout presented before the St. Louis Technical Conference of the Association of Operative Millers, May, 1960, under the direction of E. J. Gehrig, Quaker Oats Co., in association with the AOM Technical Committee, Tibor A. Rozsa, the Pillsbury Co., chairman**

MORE than 70% of the milling capacity of the U.S. today is in mills which were built prior to 1920. And more than 50% of the country's total capacity is more than half a century old.

Eugene J. Gehrig, the Quaker Oats Co., used these two facts to startle his audience to attention when he opened the New Mill Workshop at the annual technical conference of the Association of Operative Millers held in St. Louis last month.

The workshop was the first in the new and important series of studies devoted to innovational economies in mill construction and layout. The subject is one which is dear to the collective heart of management because new mills are direly needed—and new mills cost a pile of money.

That new plants are a must goes without saying, and management is anxious to provide these new plants provided the cost of construction can be so aligned that operation will be profit producing and economy making as well as product improving.

Aiding Mr. Gehrig in the study were T. C. Mills, the Ogilvie Flour Mills Co., Ltd., and Ralph Bouskill, Maple Leaf Milling Co., Ltd., plus other members of AOM's technical committee. Heading that branch of the activity and assisting with the coordination of the expert manufacturing and building participants was committee chairman Tibor A. Rozsa, the Pillsbury Co.

## 3,000 Cwt. Mill

Selected as the specimen mill was a 3,000-cwt. hard wheat plant producing flour of around 75% extraction. Location was placed at an imaginary point inside the Kansas City area, but outside of any city limit. Members attending the session were provided with a printed specification of the mill and its requirements.

Mr. Gehrig said that the closing of mills will continue due to obsolescence, poor location, changes in wheat growing areas in respect of total production and quality and other factors. The industry appears to have obtained, he declared, a reasonably close balance between capacity, production and consumption. He attributed this circumstance to the law of supply and demand.

Finally, Mr. Gehrig paid a tribute to the milling engineers and the construction firms cooperating in the production of the program. Each firm, he pointed out, could handle complete projects, but for the purpose of the workshop, each had taken a specific area.

These men, he asserted, know how "to save time and money." And would help eliminate "gold plating and pet ideas."

## Site Selection And Traffic

A discussion on selecting a desirable mill site from the standpoint of transportation was conducted by Paul Stepner, general traffic manager for the Pillsbury Co., Minneapolis. His paper was prepared in conjunction with William T. McArthur, a vice president of the Pillsbury firm.

In his initial remarks, he indicated three items which must be taken into consideration by any traffic man in connection with a new plant. These were—what is to be made, where the product will be sold, and availability of the raw materials.

Mentioned among the trained personnel involved in selecting the site were sales people, who determine where they want to sell, and wheat men, who outline the originating territory. Once the millfeed values have been ascertained, the transportation man goes to work to find several "ideal" locations. Each spot must then be investigated thoroughly from the standpoints of labor, water, taxes and other factors entering into final production and expenses. "The final location of a plant is always a compromise and no one factor, as a rule, is controlling," he said.

It was explained that in the past 15 years prices of wheat and flour have changed little, but costs of transportation have doubled. For this reason a higher degree of importance is placed on proper location as well as compelling every miller to cut transportation bills to a minimum.

## Transit No Mystery

"Transit is a great mystery to the normal layman, but actually the principle involved is quite simple. It merely permits the storing and processing of grain between the origin of the grain and the final destination of the product on the through-rate from the country point of origin to the final destinations, thus making it possible for all processors on that particular route to pay the same transportation charge," Mr. Stepner explained.

In describing proportional rates in respect to milling in transit, he stated that since the general flow of grain and flour is from west to east, the rate structure follows this pattern. The rate itself was clarified as being dependent for application on previous transportation to the point from which the rate applies or subsequent transportation from the point to which the rate applies.

The relationship of the grain rate structure with that of the grain mar-

(Turn to WORKSHOP, page 12a)

**BRITISH VISITORS — Passing through Minneapolis, and making business calls, on their way home to England after attending the Association of Operative Millers' conference in St. Louis, were these visitors from Thomas Robinson & Son, Ltd., milling machinery manufacturer of Rochdale. They are, left to right, C. Salkeld Robinson, managing director, and Christopher Jennings, overseas technical representative.**

# ...KANSAS WAS IN POLITICAL TURMOIL

**The Missouri Compromise of 1850 was being challenged and the slave-states were trying to move outside the established limits.**

**The territory of Kansas, later to become one of the top producers of fine flour, was being fought for by both factions and armed ruffians poured into Kansas over the Missouri border, only to be met by emigrants from New England determined to keep Kansas free.**

**There was bloodshed, riot and unreason, culminating finally in the national conflagration of the Civil War.**

**Today, the state of Kansas is the third largest producer of flour in the U.S.A., a mighty important factor in our national economy and a consistent user of SWISS SILK, the bolting cloth that has been the favorite of all millers since long before Kansas was admitted, as a free state, into the union.**

**SWISS SILK does not think there is special merit in being the oldest manufacturer and distributor of sifting cloth in the milling field except for the significant fact that SWISS SILK, the first in the trade, over a century ago, is still the miller's favorite bolting medium.**

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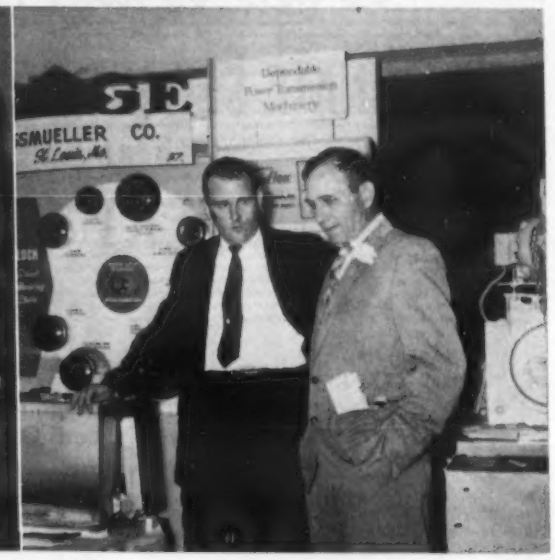
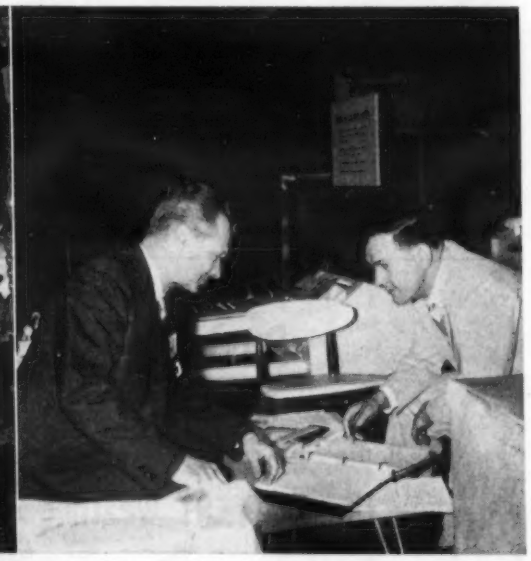
**Association of Operative Millers Technical Conference:**

# The Camera Clicks and Technologists Appear




**THE THOUGHT PROVOKING** annual conference of the Association of Operative Millers in St. Lou's is epitomized in this row of pictures. On the left is Mrs. Dan McAllister whose husband is with Colorado Milling & Elevator Co. With her are Urban Milling Co.'s Mr. and Mrs. Martin Vanderheiden. (All identifications in this and succeeding pictures read from left to right.) H. G. Walter, Hoffmann-LaRoche, Inc., makes an interesting comment for Cotton Johnson, CM&E, who was taking a turn at the registration desk and L. D. Compton, Archer-Daniels-Midland. Richard Halterman, Essmueller Co., has given food for thought to Joseph Witcher, who is with the Russell-Miller Milling Co.



**WHAT CHARLIE SAID** is known only to Ernest Roth and Fritz Schiess, Buhler Mill Engineering Co., and to Charlie himself—Charles P. Dowd, Robin Hood Flour Mills, Ltd., and to the recipient of the eyebrow scratching crack, C. Rudolph Moor, also of Buhler. In more serious vein, Ed. Cecka, MMC Sales Co., discusses Entoleter affairs with that company's representative, Guy B. Stearns.

**FROM OKLAHOMA TERRITORY** came A. G. Preuss, Shawnee Milling Co., and Don W. Pollei, the Pillsbury Co. We told our photographer to shoot some action pictures at the booths but he reported it was difficult to get people to stop working. At the exhibit of the Fluidizer Co., he was able to snap that firm's C. A. Crouch talking to Glen Benninger and Robert Ukman of the Tri-State Manufacturing Co. And at the Industrial Processes booth, the press of inquirers was such that a back view of Robert Pianansky talking with Charles Thomson, B. F. Gump Co., was all he could get.

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# Harold Goossens Discusses Sanitation At Operative Millers' Conference

Mill sanitation, its past, future and current progress—particularly as the problem of pesticide residues are related to food additives—were discussed by Harold Goossens, director of sanitation for Russell-Miller Milling Co., at the 64th annual Technical Conference of the Association of Operative Millers held in St. Louis last month.

In describing early mill sanitation practices, Mr. Goossens explained that most initial efforts at sanitation were made in the area of "housekeeping," or maintaining general appearances of the mill. This was usually accomplished by employing many sweepers and frequent applications of paint to machinery and the mill, resulting in an outward appearance of cleanliness. Some attention was given to rodent control at this time, but insect control was almost nonexistent, these pests being considered a "necessary evil" of flour milling.

Fumigation methods usually involved use of tear gas or cyanide, using a "pot method," whereby crockery jars containing sulfuric acid and water were placed throughout the mill. A paper bag, containing sodium cyanide, was suspended above the jar and men passed through the mill, "sometimes wearing gas masks" releasing the bags to allow the cyanide to combine and react with the acid. Later improvements included usage of copper piping systems through which gaseous hydrogen cyanide could be released in the mill from outside the building, replacing the more hazardous "pot method."

### Insect Concern Grows

Around 1940, ethyl bromide came into common use for general fumigations. This period also saw a more pronounced concern for insect infestation in the mills, and laboratory methods were developed to determine insect fragments in flour. Further impetus was given to more effective control measures by state and federal pure food and drug inspections. With the ensuing war years, increased demands for flour developed, leading to better methods of fumigation, and a better perspective of sanitation requirements on the part of the mills was achieved.

Besides increased general fumigations each year, periodic spot treatments of equipment became more prevalent, and widespread. Frequent spot fumigations were considered more feasible with the development of such materials as acrylonitrile, carbon tetrachloride, chloropicrin, ethylene dibromide, and ethylene dichloride, which could be mixed in varying proportions.

Mr. Goossens stated that today, appearance is no longer the primary concern of sanitation in the mills. Infestation inspections are no longer used to determine when or where to fumigate, but rather as an index of the effectiveness of preventive insect-control programs. Spot fumigations are now routine and conducted according to a set schedule regardless of presence or absence of insects.

Modern-day sanitation programs include special emphasis on ridding the mill of the flour beetle, routine spot fumigations, routine complete cleanouts, together with planned elimination of insect harborages from both old and new equipment. "Positive improvement in our sanitation achievement has been provided by the elimination, where possible, of conveyors by the re-design of the old style purifiers and reels to hoppered bottoms, by making the bottoms of sifters removable for thorough cleaning, by the removal of dead pockets in unused sifter thimbles, of dead stubs behind valves or on the sides of elevator legs and of unnecessary dead-fall boxes and by improved suction and modern wheat-cleaning systems," he added.

### Flour Packages Change

With the new conceptions of mill sanitation, gradual changes in the types of flour packages occurred. With the invention of the sewing machine, textile bags came in prominent use for both bakery and family flour.

He explained that while textiles were attractive and functional containers, insect penetration eventually led to minimum usage of fabric bags. Early practice was to include the price of the bag in the cost of the flour. For this reason, and prior to recognition of insect-infestation as a primary sanitation concern, many bakers returned their used bags to the mill for re-use. Frequently these bags were not even laundered. A regulatory order issued in some states prohibiting either the use, sale or packing of flour in used bags reduced this practice and gave further impetus to the use of the newly introduced multiwall bag.

The multiwall bag gave much better protection against insect penetration than did cottons. Chemically treated paper or tape was and still

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Harold Goossens

is used in multiwall bags in some cases.

### Bulk Flour Containers

More recent trends in transporting flour have seen the development of bulk flour containers. This innovation reduced the dangers of insect infestation during transit, but new and different sanitation problems have occurred, primarily in the area of micro-organisms.

This problem, as described, is more prevalent in the use of bulk-rail cars because moisture condensation on exposed upper surfaces provides optimum conditions for mold growth. Major cleaning problems result, and inherent high cleaning costs. Some methods employed in attempts to defeat this problem include dry cleaning, using various types of wooden, plastic and metal tools and brushes, washing of localized difficult-to-clean areas, and washing of complete cars with or without chemical cleaner-disinfectants. Means are also being sought to prevent the causes of condensation and resulting growth of microorganisms.

Two of the most successful preventive techniques to date were described by Mr. Goossens. The first is a type of ventilator operated continuously while the bulk car is in service. This provides a measure of air-conditioning and has reduced sanitation problems in bulk rail shipping considerably. Absence of moisture in the car results in little or no caking or accumulation in the car. Also, upper surfaces in the car are kept dry and clean and no mold develops on the walls, ceilings, hatches or surface of the flour. It was reported, also, that no objectionable odor is picked up during transit because of operation of the ventilator. The second development is that of a car of conventional dimensions with a fluidizing floor, walls and ceiling insulated with fiberglas and panelled with plywood, employing a plastic car-liner material.

### FDA Situation

A discussion followed regarding the Federal Food, Drug and Cosmetic Act of 1938, and recent amendments to this act affecting the milling industry. It was explained that many recent amendments to this act are related to chemical pesticide residues on raw agricultural commodities and to food additives.

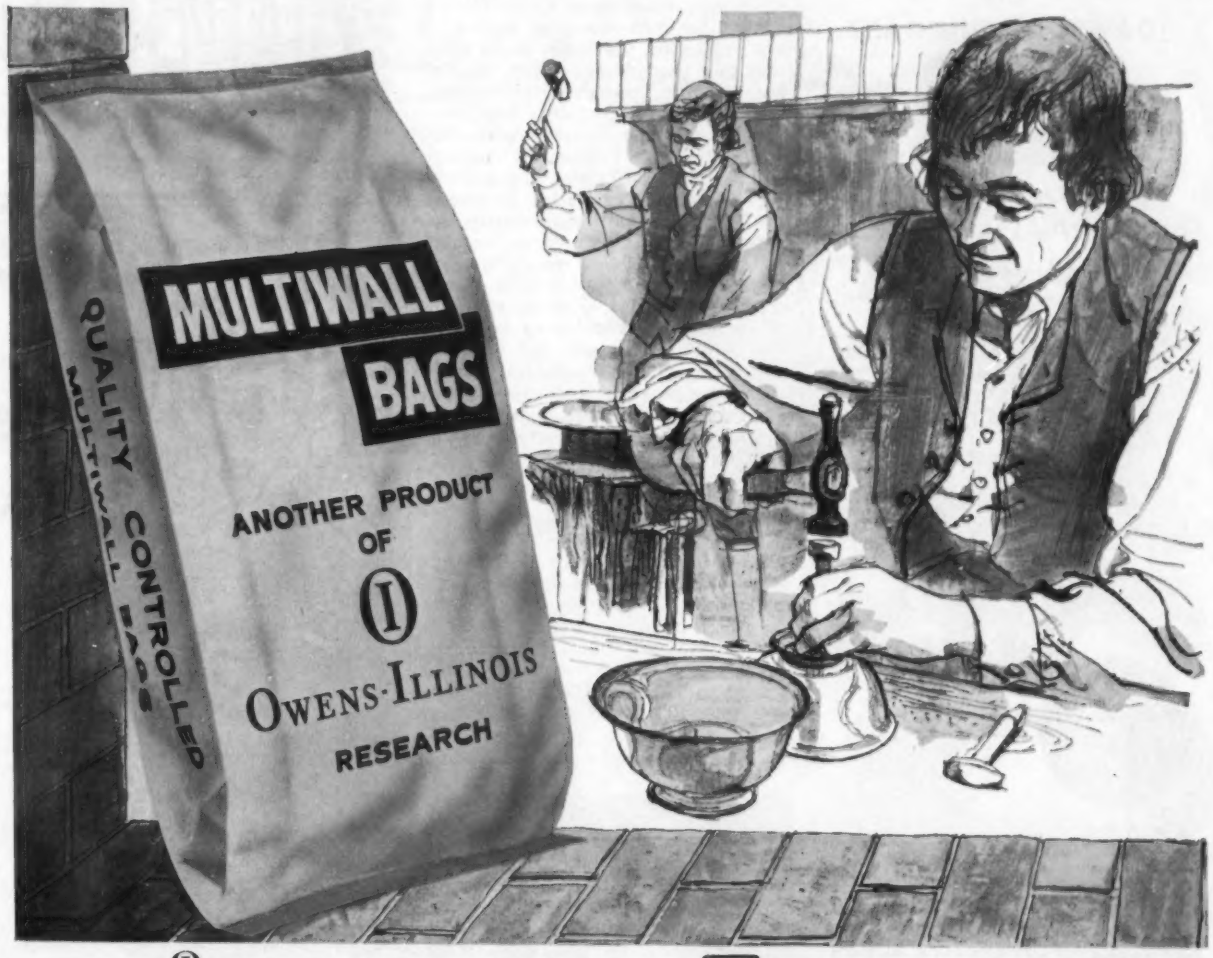
Listed as of particular significance to the industry was the Miller Pesticide Chemical Residue Amendment which was added in July of 1954. This amendment required establishment of tolerances for, or prohibited presence of, residues of pesticides or agricultural chemicals in or on raw agricultural commodities. Tolerances for pest control chemicals used on both growing and stored wheat, barley, rice, corn and sorghum have been established by the Food and Drug Administration. In milling wheat no allowance is made for concentrating or feeding flour with any agricultural chemical in which it may be present in the unprocessed grain beyond the tolerance established for that grain.

A zero tolerance was described as allowing no amount of pesticide chemical to remain on the commodity when it is offered for shipment. Several reasons for establishment of a zero tolerance were given. First, a safe level of the pesticide chemical in the diet of two or more species of warm-blooded animals has been feasibly established; the chemical is carcinogenic or has other alarming physiological effects upon one or more species of warm-blooded animals; the chemical is toxic but is recommended and normally used at times when or in such a manner that raw agricultural commodities will not bear or contain it; all residues normally are removed through good agricultural practice, such as weathering, washing or change in the chemical itself, prior to introduction of the commodity into interstate commerce.

In the area of tolerances for food additives, certain extensions of time have been made in order that certain additives used prior to passage of new laws may be proven safe or safe for their intended use. Explanation was given that all tolerances or exemptions from tolerances for all food additives intentional or incidental to a food product, must be established by March 6, 1961.

### Sanitation Committee

Mr. Goossens continued, "Your AOM Sanitation Committee was active and feels it was instrumental in getting fumigant and insecticide manufacturers to petition for establishment of tolerances for residues of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pesticide chemicals used in flour mills." By their efforts, he said, a tentative tolerance, in effect until March 6, 1961, or until revised or reaffirmed, has been set at 50 ppm for inorganic bromides from methyl bromide or ethylene dibromide fumigations. Continued use of other commonly used fumigants has been approved until March 6, under the same conditions of no-residue basis when used as fumigants or insecticides in flour mills.

In conclusion, Mr. Goossens stated, "It has been said that progress can be measured by the nature of one's problems. If one is faced with the same problem he had last year, then no progress has been made. Considering the ever-changing nature of our sanitation problems, much progress has been made. Credit for this goes to you, the operative millers, who have successfully integrated housekeeping, pest control, and elimination of insect harborages and other insanitary conditions into a sound preventive mill sanitation program."

"The future will undoubtedly see refinements in our present methods and techniques. More resistant wheat varieties undoubtedly will be developed. Biological and physical methods of insect control may be found to eliminate the need for chemical pesticides, such as potential use of insect pathogenes and the use of radiant energy such as high frequency radio waves, gamma irradiation or ultrasonics."

——BREAD IS THE STAFF OF LIFE——

## Declare Dividend

GREAT FALLS, MONT.—The regular quarterly meeting of the board of directors of Montana Flour Mills Co. was held in the general offices of the company at Great Falls. Among other actions taken was the declaration of a dividend of 20¢ share, payable June 10, 1960 to stockholders of record June 1.

E. A. Stanger

**NAMED DIRECTOR—E. A. Stanger has been appointed a director of Henry Simon Ltd., Cheadle Heath, England, construction firm. In his new position, Mr. Stanger reports to G. Highley Sugden and is responsible for Simon's flour milling business covering the building of new mills and reconstruction work throughout the world. He will also work on the promotion of development projects in new milling machines and processes. Mr. Stanger is also a director of Simon-Carter Co., Minneapolis, and the Simon Engineering Co. of Canada.**

## Export Elevator Construction to Start In Southern California

KANSAS CITY—The contract for construction of a new and modern grain facility on the Pacific Coast has been awarded to Weitz-Hettelsater, Engineers, Kansas City and Des Moines, designers and builders of grain storage and processing facilities.

The new export elevator is to be built at the Port of Long Beach, Cal., making it the first port grain elevator facility in southern California.

When completed, it will load ships at a rate of 43,000 bu. an hour and store over 830,000 bu. grain. Present engineering has taken into consideration future expansion plans for a total storage capacity of nine million bushels.

Weitz-Hettelsater will construct the $4 million plant for the Long Beach Harbor Department, which will lease it over a 40-year period to Koppel Bulk Terminals as operators.

——BREAD IS THE STAFF OF LIFE——

## Mill Employment

SAN FRANCISCO — Employment in grain mills in California remained at around 7,200 persons between the first quarter of 1958 and the corresponding period of 1959.

The division of statistics and research of the California State Department of Employment reports an increase in earnings for the period—from $9,810,873 paid during January to March in 1958 to $9,884,713 for the same months of last year. The number of grain mill firms had risen from an estimated 222 to 224.

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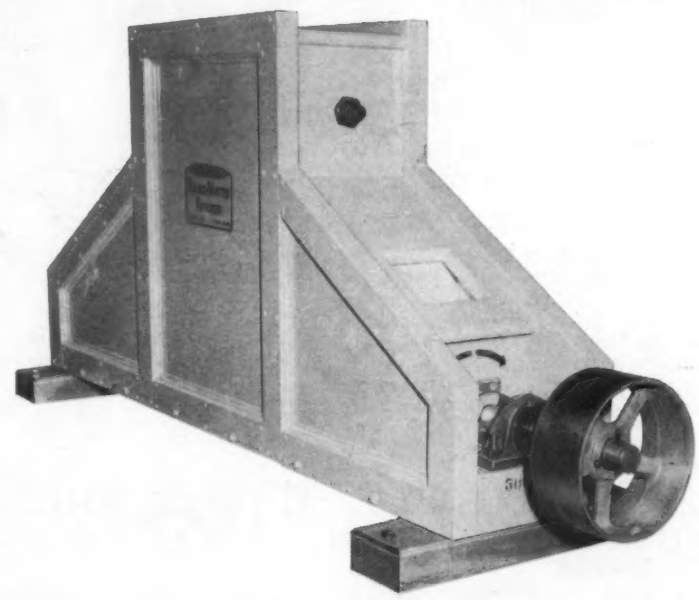

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# Joshin' at the Jefferson . . .

## *Technological Titillations*

THE 64th annual technical conference of the Association of Operative Millers held at the Hotel Sheraton-Jefferson in St. Louis May 23-26 was a hard-working conference in line with the tradition established over the past few years. A look inside the conference room or a visit to some of the committee huddles was enlightening to anyone who has the impression that a convention—AOM officials actually ban this description—is merely an excuse for play.

●

But there was a lighter side. Some of the members attending preferred train to plane, and the Rock Island Rocket was a favorite steed for some Minneapolitans—including Pillsbury's George Wagners and Commander Larabee's Douglas Merritts. Scheduled to travel on the train were the Fritz Schiess' from Buhler Mill Engineering. A heavy rainstorm in Minneapolis delayed traffic and they failed to make it by minutes. They headed for Northfield to catch up, but again were delayed, so switched to a plane. But the coffee-drinking Schiess' missed the plane connection in Chicago and hit St. Louis in the early hours of the following morning—minus Fritz' luggage.

●

The rocking Rocket reminded Laverne Wagner that she and her husband spent the first night of their honeymoon aboard a train. Said she: "Sure was a fast way to get acquainted!"

●

Mrs. Wagner delivered a phone message to her husband when they met at the depot. She said: "Roy Durham called—but I can't remember whether he's going fishing with Bill Rainey or going fishing to Rainy Lake." Friends of ex-Pillsbury man Durham and Commander Larabee's Rainey commented laconically: "Indubitably both."

●

**The operative millers take their knowledge gathering task seriously and make copious notes. Noticeable, too, at this meeting was the large proportion of allied men who sat in on the meetings. This in itself was a tribute to the quality of the program arranged by the program committee—Arlin B. Ward, the Pillsbury Co.; Paul McSpadden, Commander Larabee Milling Co., and Fred Abbott, General Mills, Inc. Paul Wagner, Russell-Miller Milling Co., was general chairman with G. Edward Mehleck, Screw Conveyor Corp., as secretary-treasurer.**

●

This was Ed. Mehleck's first appearance at an AOM conference for Screw Conveyor. He joined the firm recently after serving Alexander Bros. Belting Co. for many years.

●

Missed by many members was former president R. R. Brotherton, Bay State Milling Co., whose wife was hospitalized. Bob sent a congratulatory telegram to the meeting. So did Ralph Bouskill of Maple Leaf Milling Co., whose associate in the same firm, Stuart Butler was elevated to the presidency. Ralph, another ex-president, stayed behind to "look after the shop."

●

Clint Brooke, Merck & Co., thinks he's psychic. Operating the electric razor prior to an early morning breakfast appointment, he remarked to room companion B. Wayne Carmichael: "I could sure use a cup of coffee." At that moment a waiter walked in carrying an aromatic pot of the desired beverage, but when Mr. Brooke protested he had not ordered it, the waiter pleaded with him to accept it because the Merck room was the room number on the ticket.

Whosoever failed to get a pot of coffee one morning may write to Mr. Brooke and he will receive a copy of the latest booklet on enrichment in recompense.

●

**Russell - Miller's Francis McAdams did a sterling job as head of the registration committee when Pillsbury's Adrian Rutherford had to pull out at short notice. And Mrs. McAdams, co-chairman with Mrs. Paul Wagner of the ladies' committee, helped out at the desk. Mr. McAdams also headed the advertising committee.**

Essmueller Co.'s Bob McLean and Arthur Essmueller chaired the banquet committee and maintained the high standard set at previous AOM meetings. Particularly praised was the entertainment. The more than 500 people present on the occasion were left in no doubt about the venue of the 1961 meeting . . . Minneapolis. The dates—May 22-25. Donald S. Eber, executive vice president, read a letter of welcome from Mayor P. K. Peterson of the City of Lakes, and at the conclusion the band played the stirring University of Minnesota Rouser, much to the delight of the


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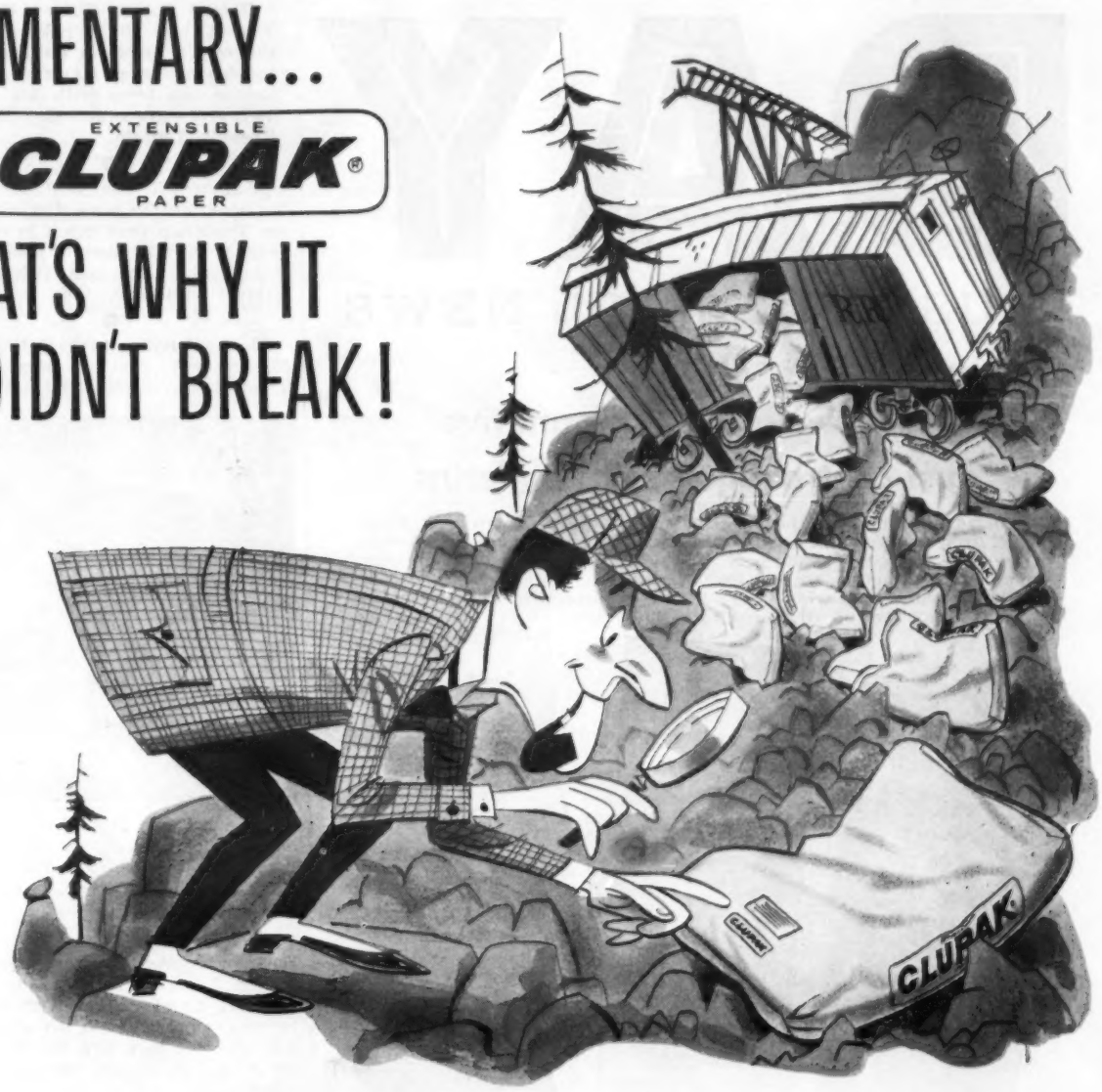


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Minnesotans present. Some of them actually sang along with the band.

●

Bob Artz, Wallace & Tiernan, Inc., chaired the allied trades committee and again the high standard of former years was maintained for the annual party.

●

Many visitors came from overseas to attend the conference. The Steve Jedlins from Sydney, Australia, were a popular pair. Ruth Jedlin spent five years as a nurse before her marriage, but she told us confidentially of her determination not to marry a doctor, as so many nurses do, because of the night calls. But she now finds being married to a miller is worse—what with chokes and the like in the wee small hours.

●

Mr. Jedlin wishes to deny that he has chokes of any consequence in his mill.

●

Newly married pair at the conference were MIAG's Hans and Inge Koch—barely three months in wedlock. And Inge did her share of the chores for the busy MIAG group headed by Ernst Auer.

That popular prof. from Kansas State University, Gene Farrell, was the happy recipient of the president's plaque for pulling in the most new members during the past year.

●

Major S. Howe, who has achieved emeritus status in operational miller circles, breezed around visiting his old friends in the business.

●

Greatly missed at the meeting was Mrs. Roger Pratt, wife of the Wallace & Tiernan veteran. She had to pass up the affair because of hospitalization.

●

**Roland Tobler, Tobler, Ernst & Traber, was the popular host at the men's luncheon on the opening day of the conference. He shared the bows with his associates, Syl Catone and Roy Kehr of Kressilk, Buffalo.**

●

Wallace & Tiernan hosted the ladies for lunch on the same day with Walter Tholstrup very much in evidence —again with his team of young ladies to buttonhole the men with the traditional white carnation.

●

Most splendiferous hat at the conference was that of Mrs. George Tesarek—George is with Quaker Oats

Co. Vienna-born Mrs. Tesarek sported a hat decorated with wheat. Perhaps next year we can expect to see a hat decorated with Quaker Oats.

●

A retired Essmueller man, David Barkley, headed the reception committee. He went through the roster of AOM, no mean task with a membership topping 2,000, to check his seniority. He says he's No. 10 on the list as a dues paying member for 40 years.

●

Happy occasion it was for Warren and Zeke Keller—he's with Sterwin Chemicals, Inc.—for they celebrated their 25th wedding anniversary during the conference. The thoughtful Don Eber provided an anniversary cake and the happy couple was aided by Dick and Katy Bradford, now resident in Sacramento, Cal., for Pillsbury, in celebrating.

●

Konrad Wissmar, Maple Leaf Milling Co., Ltd., came to Canada from Germany and he was honored with a spot on the program, fulfilling expectations with an excellent paper. Konrad's family has a milling history in Germany going back to 1426.

●

Charles P. Dowd, Robin Hood Flour Mills, Ltd., was observed making a reservation for a return flight to Minneapolis, but his waiting friends found their vigil overly long. After 10 minutes they approached the counter to find the ebullient Mr. Dowd purring with a sweet young ticket seller — name of Ann Dowd. Miss Dowd was reportedly fascinated with the avuncular Mr. Dowd.

●

Another long distance visitor was Demetris Sarandis, South India Flour Mills, Madras, India. He recently completed the AOM correspondence course.

●

We are still awaiting payola from those who visited the Anheuser-Busch brewery and who do not wish their names published.

●

A special request we gladly grant —mention of the fact that T. Chris Mills, Ogilvie Flour Mills Co., Ltd., passed up the brewery to pay a visit of inspection to the Ralston Purina research lab and feed plant.


# DAY

## DUST CONTROL NEWS

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**"SCHLITZ DEFEATS DUST"** — FOOD ENGINEERING magazine reprint describes all out dust control for 3½ million bushel Schlitz grain elevator. Request Bulletin "Schlitz Defeats Dust."

**"EFFICIENT DUST SNATCHERS"** — Bulletin describes DAY's part in providing maximum safety and good housekeeping for starch packing building of large food processor.

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# FOR POSITIVE "Sterile Zone" INFESTATION CONTROL

For years the Entoleter Impact Mill has been recognized as the positive method for insuring complete freedom from live insect, larva or egg infestation in flour.

However, occasionally instances have occurred where infestation has slipped through at the start of a run (due to opening the flow line too soon before rotor has come up to full killing speed) or at shutdown time (when operator leaves flow line open as rotor is stopped or slowing down).

In order to eliminate the possibility of this human error, Entoleter, Inc. offers the STERILE ZONE POSITIVE SEAL which can be affixed to any existing Entoleter Impact Mill.

## ITS FUNCTION

The STERILE ZONE POSITIVE SEAL automatically opens the flow line at the machine only when rotor speed reaches 100% efficiency and closes the line completely before the rotor speed is reduced below this point. This foolproof control eliminates any possibility of contamination of the STERILE ZONE product.

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# Operational Improvement Program Modernizes Flour Mill at Almonte

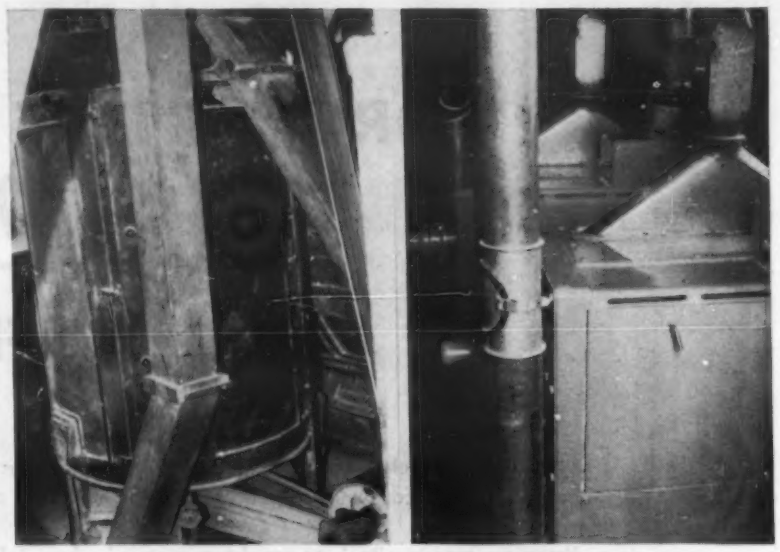
OTTAWA—Recent remodeling and modernization at the Almonte Flour Mills near Ottawa has produced numerous operational improvements for owner, Phillip Strickland, it is claimed.

Among these are: 1. Increase in daily capacity of 100 cwt. flour; 2. increase in extraction of 2½%; 3. better ash figures and higher protein content and, 4. lower maintenance, fumigation and heating costs.

To attain these results Mr. Strickland replaced some of his old machinery with two new Buhler middlings purifiers (triple deck); two centrifugal bran finishers; a pressure filter; prefabricated metal spouting and such incidental equipment as an airlock, fan and automatic water wheel dampener. All equipment was supplied and planning done by Buhler Brothers (Canada), Ltd.

NEW PURIFIERS PART OF ALMONTE PROGRAM

New Purifiers — Old Purifiers



ALMONTE FLOUR MILLS SHOWS 'MODERN DRESS'

Old Bran Finishers — New Bran Finishers

The two new purifiers replaced three older ones and have the advantage of producing the maximum quantity of clean low ash middlings at the head of the milling process, stated Buhler officials.

The new Buhler centrifugal bran finishers cut out the loss of time in setting brushes and are reportedly economical on both power and maintenance while, at the same time, increasing the extraction.

### Metal Spouts

The metal spouts prevent infestation and save on housekeeping. They occupy less space than wooden spouts and erection is much faster.

In addition, the new machinery is more compact, thereby offering a greater amount of usable space to the miller.

Before the new installations, air was blown out of the mill by cyclones, which resulted in a continuous loss of flour and heat. A pressure filter now returns all the aspiration flour back into the mill. Furthermore, in winter all the warm air is put back into the mill which results in better milling results and lower heating costs.

The photos accompanying this article illustrate clearly the effects of the modernization program in the Almonte mill.

—BREAD IS THE STAFF OF LIFE—

### ELEVATOR BEING BUILT

KIM, COLO.—Work has started on the new grain elevator here by the Showalter Grain Co. The facility, owned by Earl Showalter, La Junta, and Jay Showalter, Las Animas, will have a grain handling capacity of 3,000 bu. an hour. Included will be a warehouse, tanks and scales and featured will be a complete grain handling service in addition to the sale of feed. Jack Pearce will be manager of the new elevator, scheduled to be in operation later this year.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Tom L. Jones

**NEW POST — Tom L. Jones has joined the Gilman Paper Co. as special representative in the multiwall bag division. He is a former vice president and director of multiwall sales of Arkell & Smiths, and was recently regional sales manager of the multiwall division of West Virginia Pulp & Paper Co. In his announcement of this appointment, Howard Gilman, executive vice president of the Gilman firm, states that Edward Burgers, Jr., has been named sales manager of the multiwall bag division. Harry C. Lawless has become a staff vice president and a member of the executive advisory committee. Dean Wellington has been appointed general sales manager with authority over several divisions.**

## Treated Grain Law 'Welcome' in Oklahoma

STILLWATER, OKLA.—According to J. R. Enix, wheat marketing specialist at Oklahoma State University, "Oklahoma's grain industry welcomes" the state legislature's new act providing for fines up to $1,000 for anyone convicted of offering treated grain for sale for food purposes.

Mr. Enix believes that most violations have been caused by some accidental mixing of treated grain with untreated grain for the market. Grain inspectors are alerted to detect those contaminated grains which are toxic and unfit for humans or animals.

——BREAD IS THE STAFF OF LIFE——

## Richardson Scale Co. Names District Head

CLIFTON, N.J. — Appointment of Joe R. Vogel as Philadelphia district manager has been announced here by officials of Richardson Scale Co., engineer and manufacturer of automatic weighing and proportioning equipment and controls.

Joe R. Vogel

Mr. Vogel three years ago opened a Richardson district sales office at Boylston Center, Mass., to serve the New England area. Prior to that assignment he spent a year in the sales engineering department. He also received training in materials handling and the application of automatic weighing in various industries in Richardson's service department.

## Kenneth A. Wilson Named Advertising Manager at Victor

CHICAGO—Kenneth A. Wilson has been named advertising manager of Victor Chemical Works. The announcement was made by M. R. Stanley, vice president of the recently merged division of Stauffer Chemical Co., in a move to reassign duties formerly held by E. M. Myers, Stauffer director of advertising.

Mr. Wilson left a similar post at Illinois Baking Corp. in 1957 to join Victor's advertising department. A graduate of Chicago's American Academy of Art, he has been active in several phases of the graphic arts.

——BREAD IS THE STAFF OF LIFE——

### NEW ZEALAND IMPORTS

AUCKLAND — New Zealand expects to reduce its import requirement of wheat this year to 4 million bushels, a reduction from 1959 of 3 million. Australia is the major supplier. The sown acreage and expected yields have increased.

## Elevator Clearance

HUTCHINSON, KANSAS — Vast improvement in the wheat outlook is leading to expanding clearance of country elevators throughout central and western Kansas. Wheat in the several central counties surrounding Hutchinson has improved remarkably, says Charles Colby, Hutchinson broker.

Wheat which originally was extremely thin now appears set for good yields and weather conditions have been favorable for good protein.


With a Fuller Airveyor Conveying System . . .

# Unloading 30 Tons of Feed Ingredients In Less Than One Hour Is a One Man Job at Ralston Purina

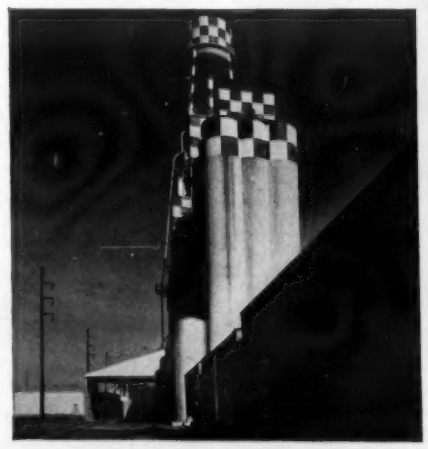
A Fuller Telescopic Airveyor® pneumatic conveying system moves bulk animal and poultry feed ingredients from siding to storage at Ralston Purina's Harrisburg, Pa., mill. The operator keeps the Airveyor nozzle buried in the material by regulating the length of the hose—the telescopic Airveyor conveying system does the rest.

Soybean meal, midds, bran, and other ingredients are sucked vertically 165 feet up 12 stories to any one of 30 storage bins. As the operator works deeper into the car, he simply pushes a button to raise or lower the hose one foot or twenty to reach *any* point within the car. Work never stops to add or take off sections of hose.

Obtaining the savings inherent in bulk purchasing, eliminating the dust hazard, and greatly reducing handling costs are some of the ways Fuller Airveyor conveying systems cut operating expenses in the moving of dry, bulk materials.

Consider the low initial cost and many operating economies of Fuller pneumatic conveying systems when you plan to increase plant capacity. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendation. 1323C A282

Operator controls unloading of feed ingredients at rate of 30 tons an hour — up 12 stories to storage, just by pushing a button.



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## WORKSHOP

(Continued from page 1a)

keting pattern was outlined as very close. Also included in the grain rate structure was the physical operation of the railroads. In this area, Mr. Stepner stated: "Although for the most part flour moves by rail, truck and water, transportation must be considered for the future, as it may mean the failure or survival of a mill."

One major factor pointed out in truck transportation is that grain is exempt from rate regulation by the Interstate Commerce Commission. Prices of transporting grain depend on what type of deal is made between the shipper and the trucker. One favorable factor here was that of local mills having advantages in selling locally as opposed to mills trying to reach the markets by rail.

With improvements in the navigable waterways, plus existing ones, possibilities of tremendous changes in competitive activity were pointed out. Tonnage requirements out of proportion with that of rail shipments were noted as the main reason for current minimum water movement.

Experiments and research in the use of bulk barges to bulk terminals on the river for bulk truck or rail shipment beyond were cited by Mr. Stepner.

### Pros and Cons Cited

Since the proposed site of the mill was that of Kansas City area, a brief summary of advantages and disadvantages of this location followed. Favorable factors for the location included—excellent outlets for millfeed, geographical location, good wheat sources, selling territory, water transportation facilities, and excellent opportunities for selling within the city. Disadvantages included too great a back haul to sell competitively in neighboring states and trends among central states bakers to discontinue blending winter and spring wheat, instead buying blends for bulk delivery.

Paul Stepner

"By putting the pros and cons together, one has to conclude that Kansas City is a good location for a hard winter wheat bakery mill, the pros far outshadow the cons, and in the final analysis this is the way mill locations are decided," he said.

Spot adjustments of the rate structure on the part of railroads were covered briefly in a discussion of efforts of the rail companies to recapture business lost to truck and water transportation methods.

In closing, Mr. Stepner stated, "The one point to make is that today's transportation uncertainty, placing dollars in brick and mortar, could result in a big disappointment, a few years hence. It is impossible to predict the changes in the transportation structure which could be very detrimental to some mills and helpful to others. The present transportation picture is very confused and difficult and it would be exceedingly dangerous for anyone to try to locate a new mill today with any uncertainty as to the transportation future. Perhaps someone will solve our problems by dreaming up a mill which could be moved at little expense in order to take advantage of the changing transportation conditions."

## Cleaning House

Plans for a modern Cleaning House accenting maximum efficiency and economy were the topics of discussion presented by Donald Deane of the Simon-Carter Co. In his opening remarks he stressed the importance of efficient preparation as concerns the success of any over-all milling operation.

In describing the preliminary cleaning process, he explained that it generally makes comparatively coarse separations of impurities, being designed to remove only the worst of chaff and larger impurities which might result in mechanical failure of the equipment. The remaining impurities, if not extracted, result in harmful effects on baking quality, ash, color, odor, or flavor of the flour.

Basic requirements in cleaning wheat were outlined and a brief summary of the generally accepted methods of cleaning was presented, including sieving, aspiration, indented surfaces, magnetic separators, washing and friction scouring. Also accompanying the presentation was a schematic diagram, denoting position


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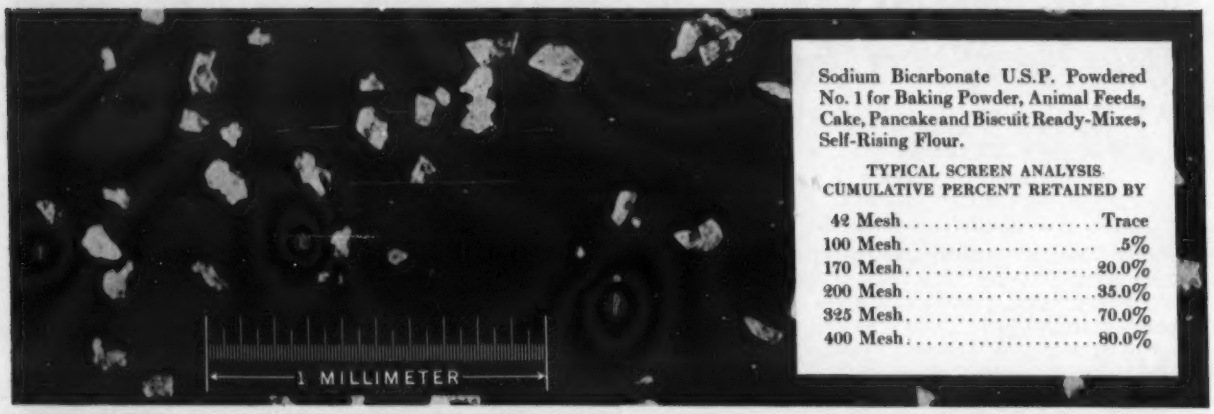


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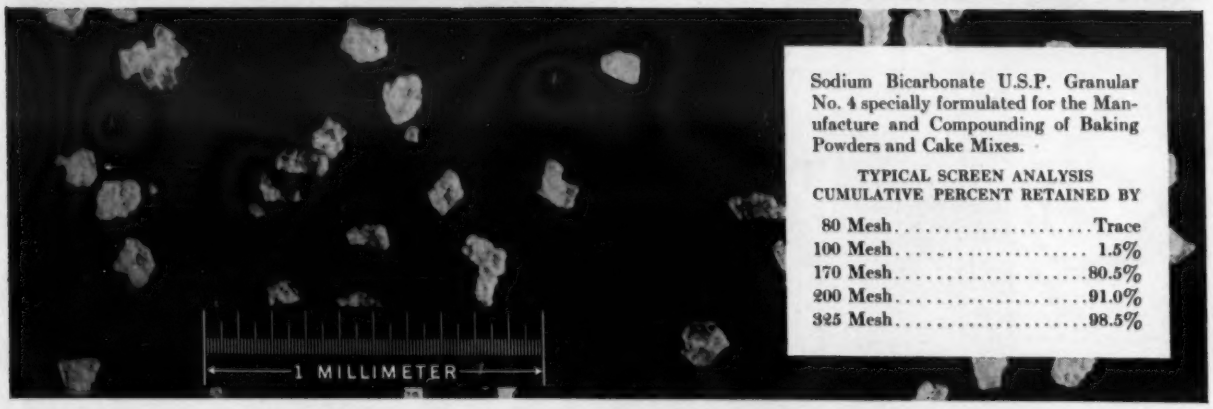
TYPICAL SCREEN ANALYSIS CUMULATIVE PERCENT RETAINED BY

| | |
|---|---|
| 42 Mesh | Trace |
| 100 Mesh | .5% |
| 170 Mesh | 20.0% |
| 200 Mesh | 35.0% |
| 325 Mesh | 70.0% |
| 400 Mesh | 80.0% |

Sodium Bicarbonate Treated Free-Flowing (U.S.P. Powdered No. 1 blended with approximately 4% Tri-calcium Phosphate) for Self-Rising Flours and Cake Mixes.

TYPICAL SCREEN ANALYSIS CUMULATIVE PERCENT RETAINED BY

| | |
|---|---|
| 42 Mesh | Trace |
| 100 Mesh | .5% |
| 170 Mesh | 20.0% |
| 200 Mesh | 35.0% |
| 325 Mesh | 70.0% |
| 400 Mesh | 80.0% |

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TYPICAL SCREEN ANALYSIS CUMULATIVE PERCENT RETAINED BY

| | |
|---|---|
| 80 Mesh | Trace |
| 100 Mesh | 1.5% |
| 170 Mesh | 80.5% |
| 200 Mesh | 91.0% |
| 325 Mesh | 98.5% |

Don't jeopardize the shelf life or performance of your Baking Powder, Self-Rising Flour or Cake Mix with an inappropriate granulation of Sodium Bicarbonate. Insist on Church & Dwight. You'll get the widest selection of grain sizes because Church & Dwight is the country's largest supplier of Sodium Bicarbonate U.S.P. You'll also get unmatched technical service based on more than 100 years of experience in formulating Sodium Bicarbonate. Unusual grain size requirements given special attention. Try us and see.

CHURCH & DWIGHT CO., INC., 70 PINE STREET, NEW YORK 5, N.Y.

of machines which performed basic cleaning separations.

In the initial stages, Mr. Deane stated that incorporation of the dirty wheat storage bins into the mill building proper was advantageous from two angles: 1. The dirty wheat blending can be closely supervised by the mill operating crew. 2. The elevator can often be closed on weekends, whereas if the wheat supply to the cleaning house was drawn directly from the elevator, it might involve having an elevator crew present at all times.

Volumetric feeders were described as the first section of the proposed Cleaning House, up to tempering, their primary function being that of blending the wheat on a volume basis to provide any percentage mix of different wheat varieties.

Prior to entry of the wheat into the first pneumatic level, a magnetic separator was recommended in order to remove large pieces of metal which are especially damaging to air locks and pneumatic equipment.

Mr. Deane then traced the passage of the wheat through the pressure line, into the dirty wheat scale, where quantities of wheat passing into the cleaning process are recorded. Recommended here was a pneumatic aspirator placed at the top of the lift for achieving screenings separation, which he described as highly desirable during this step of the operation.

### Process Described

The entire cleaning process, including each pneumatic step and operation was then described, including the dirty wheat scale, mentioned above; sieving; dry stoning; indented surfaces; dry scouring, preceded by a magnetic separator to minimize chances of sparking; washing, providing for a water addition control; tempered wheat storage, employing volumetric feeders driven by an independent motor with remote start and stop devices; wet cleaning, consisting of light scouring or brushing action and a final independent aspiration.

In discussing the final aspiration, he explained the step this way: "In multi-purpose machines which embody an aspiration in addition to performing other separations by sieving or securing, the design of the aspirating channels is usually a compromise to suit the general dimensions of the machine which are determined by the duties performed. The design of the aspirating channels in a machine intended solely as an aspirator can usually be such that a greater degree of efficiency is achieved."

Final steps in the over-all process, beginning with the grinding bin, were then covered. The grinding bin was described as being fitted with high and low level indicators coupled by an electrical circuit to the motor driving the volumetric feeders under the tempered wheat bins. He stated that the added expenditure for this automatic control was well worth the initial investment, since it resulted in a regular supply of wheat to the mill plus the safeguard against any chokeback by stopping the wheat supply from the temper bins, once the high level indicator was touched.

Donald Deane

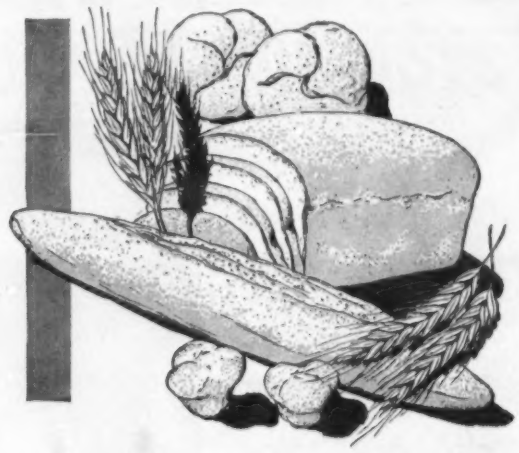
An earlier recommendation for remote stop and start devices for the volumetric feeders was further clarified as being incorporated to ensure trouble-free operation with minimum supervision. Again, less chances for choking and stoppage of the wheat supply. A brief explanation of screenings disposal concluded this phase of the discussion.

In his presentation of the proposed layout, Mr. Deane called attention to the positioning of machinery. Multiple outlets were shown on all bins to facilitate even wheat discharge across the bin area. The main bin block was located at the end of the building nearest the elevator. Screw conveyors were set up to distribute the wheat to and from the dirty wheat and tempering bins. Also, the combined washer and whizzer was located on the top floor so the wheat could be conveyed directly into the temper bins without any pneumatic elevation of wet wheat being required.

### Cost Assessment

Since types of wheat processed in the mill, as well as the type of equipment installed, would have a large bearing on the over-all costs, Mr. Deane explained that exact figures for the cost of such an installation could not be given. He pointed out that his plan incorporated all the bas-


# FLOUR FOR MAN'S BREAD*



*A Brief History of Milling and Baking of which this is the twenty-sixth and final chapter by* SCIENCE WRITER

**CHAPTER XXVI** *Enrichment Up-To-Date (Part II)*

### How Enrichment Has Helped Health

Quietly, without fanfare, some notable medical achievements have been made in recent years. Among these is the virtual disappearance of several serious diseases from the U. S. A. No longer are *pellagra, beriberi, ariboflavinosis* the medical and public health problems they were just a few short years ago.

These are dietary deficiency diseases, whose present rarity is credited to the enrichment of white bread, white flour and other cereal foods with vitamins and minerals.

That these diseases are truly rare is demonstrated by the fact that today's medical students must be shown colored pictures of patients afflicted with the diseases. There are so few actual cases that even the largest hospitals rarely receive one in years.

### Support From Physicians, Nutritionists, Legislators

Enrichment of family white flour and of white bread and rolls is practically universal today in the U. S. A. The medical profession, through the American Medical Association, endorses enrichment. So do nutrition experts. The legislatures of a majority of states including the new states of Alaska and Hawaii plus the Commonwealth of Puerto Rico have passed laws making enrichment of all white bread and family white flour mandatory. After careful tests which demonstrated the great value of the practice, Newfoundland required enrichment as early as 1944. In Canada enrichment has become widespread, following a 1952 change in government regulations.

Millers and bakers, large and small, individually and in association, support the idea of enrichment. They show their support in the most practical way possible; year after year they make their good foods better through enrichment for the better health of all.

### Other Foods Follow Suit

Other cereal grain foods have benefited by the restoration of vitamins and minerals which may inescapably be lost in processing. These include corn meal, corn grits; macaroni, spaghetti, noodles and other alimentary pastes; farina, and pastina. While the practice is not universal for each of these foods, by far the greater share of each sold in the United States is "*enriched.*"

Many breakfast cereals use the process of vitamin *restoration* or *fortification*. As explained in the previous chapter, these processes, too, have the aim of overcoming a deficiency of essential nutrients, but as a group have no Standards of Identity.

Milled white rice is the latest in the long list of cereal grains to be improved through the use of vitamins and iron. South Carolina and Puerto Rico now require that this practice be followed as do many countries throughout the world. It is expected that other states will make the same requirements.

### Vitamins By The Tons

Enrichment would not have been possible if ample supplies of pure vitamins had not been available at low cost.

It's a fact of our times that marvels are made in laboratories. Such was the case with vitamins. Scientists first isolated the pure substance. Second, they learned its chemical composition. Third, they "duplicated" the vitamin by synthesis. And fourth, with the help of chemical engineers, they expanded the laboratory techniques to full-scale commercial operation.

A vitamin is still a vitamin whether it is extracted from natural sources or made by man. Remarkable as it may seem for such complex substances, it has been found that large manufacturing operations produce pure vitamins at a cost lower than if they were secured by extraction.

It is these abundant, man-made supplies of vitamin $B_1$ (thiamine), vitamin $B_2$ (riboflavin) and niacin which supply millers, bakers, macaroni makers, breakfast cereal manufacturers with the means to make their foods more valuable.

### The Roche Review

A compact chart giving the enrichment requirements necessary for cereal grain foods to meet the federal and state regulations is available without charge. If you will find this chart helpful for reference or as a teaching aid, just send your request to the address below, asking for the Review of Enrichment Requirements.

### A Farewell Note

This is the final chapter in the series which has been published by Hoffmann-La Roche as a service to millers, to bakers, and to everyone else concerned with the quality of cereal foods.

*This series has been based, in large part, on the book "Flour for Man's Bread: A History of Milling" by John Storck and Walter Dorwin Teague, published by the University of Minnesota. Roche expresses its gratitude to the copyright holder for the excellent cooperation which helped make this series possible.

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**Enriched with vitamins and iron for better nutrition**

ic requirements to ensure a clean wheat, but that certain items of equipment could be deleted with some sacrifices in cleaning efficiency. Total estimated cost for this proposed mill was placed at $80,000 or $270 bu.

In conclusion, Mr. Deane noted that every provision had been made for accurate cleaning of the wheat in the mill. "You will all readily appreciate that this plant could incorporate alternatives at various points to suit other local conditions or individual preferences. For example, provision could easily be made to treat and recover unthreshed wheat if this problem presented itself in any area. The only true economies possible in the cleaning house are those resulting from the non-inclusion of superfluous or inefficient equipment.

"The basic requirements must be provided and we believe that the wheat cleaning plant just described provides for this aspect while considering maximum economy of building consistent with the general and over-all building layout."

## Flour Mill

Development of a cost figure for the proposed flour mill, along with recommended equipment for each operation, were subjects included in a presentation by Ernst Auer, MIAG Northamerica, Inc.

The subject matter was held primarily to a listing of required equipment because of the familiarity of the audience with the details of equipment functions.

First in the proposed requirements was that of the installation of 19 double roller mills with rolls of 10 in. diameter and 40 in. length. The recommended roller mills would have feeders designed to handle various stocks with the exact distribution of rolls to breaks, sizings and middlings depending on the ideas of the various people involved in construction. Anti-friction bearings would be included and such optional items as automatic engaging and dis-engaging devices for feed and grinding rolls, and chain differential drives instead of gears.

He explained that in line with stressed economy, the roller mills would be driven from the lineshaft rather than with individual drives.

Recommended next were six sifters of square sieve dimensions, each with six sections and 27 sieve frames, occupying a bolting surface of approximately 2220 square feet or .74 square foot per cwt. He explained that inclusion of the rebolter sections would involve a sifting surface of 81 square feet per cwt. Individual drives were suggested for use in this section.

Seven to eight purifiers were the next items to be described. Individual drives were again recommended and an option of double type, quadruple type or a combination of both was offered for consideration.

Bran finishers were included for coarse and fine bran off the 5th break sifter and for coarse scales off the 4th break sifter.

### Material Handling

In discussing material handling Mr. Auer stated: "The handling of mill stocks in a modern mill would, without any question, be with a pneumatic conveying system, which is therefore proposed for this mill. The only mechanical conveyors would be the flour pick-up conveyors, located on the 3rd floor, and our lay-out shows these conveyors in table height, which means that the valves for distribution of flour to the various conveyors are easily accessible by the operator. The mill pneumatic system would be divided into two groups."

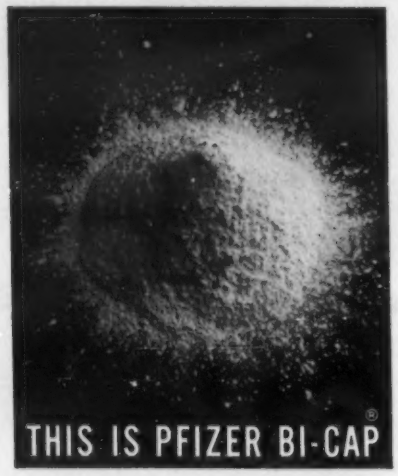
With reference to air handling and dust control, eight suction filter dust collectors occupying a total air volume of 24,000 cfm. were recommended. It was mentioned that two of them were required for the two groups of the pneumatic conveying system and one filter was required for the purifier and general suction.

It was explained that such accessories as prefabricated spouting systems, complete lineshaft system, belts for the roller mills, conveyors and complete prefabricated duct work, as well as other small materials and spare parts would be included in the total costs to be quoted.

In the area of flour treatment, sufficient feeders were provided for the addition of bleaching chemicals, enrichment, bromate and malt, and agitators for application of bleaching gas to various flour grades were also included in the plan. Pressure pneumatic conveying systems were recommended for purposes of moving the streams to the flour scale in the packing and bulk storage section.

A set-off bin with a capacity of one hour was provided for start-up of

Ernst Auer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O. J. Zimmerman

the mill and for changes in wheat mix.

With regard to instrumentation, stream weighers were mentioned, but the suggestion was offered that they be considered an optional item. Moisture testers were presented as a more important consideration as well as a control sifter, and sufficient space to lay out and check samples. These items were included in the over-all cost picture.

### Cost Assessed

Final cost for the previously listed machinery was set at approximately $375,000, or $125 per cwt. Inclusion of certain optional machinery would involve an additional $30,000 or $10 per cwt.

In summary, Mr. Auer said, "Equipment for impact grinding and air separation has not been included in this project, because the factors involved are so complicated and so individual with each flour mill and its type of business.

"There are, of course, many variations in the above-mentioned prices down as well as up, but it is our opinion that the cost figures represent a flour mill which has an optimum degree of efficiency and the minimum possible cost for this optimum."

## Handling

O. J. Zimmerman, SMICO Sales Co., handled the situation as it related to bulk flour flow, describing for the millers the cost of the bulk flour and feed sections. He estimated the cost at $159,000, including the motors, but he stressed that no allowance had been made for installation.

The technical committee had set bulk storage requirements at not less than 72 hours of mill operation for flour and not less than 24 hours for feed. The mill would be served by two tracks on one side, and provision was made for doubling the capacity by the addition of another unit.

This was the exercise set Henry Schipke, the Minneapolis consulting engineer. The cost of building the bins, flour and feed systems came to $379,000 or $126.32 cwt. The bulk bins, scale house, two-floor elevator and stairway would cost $179,000 or $59.66 cwt. Included were the all-steel welded bulk bins with housing, heat and lighting, taking up $40.33 cwt., or 68% of the total building costs. Basic buildings and equipment, less installation, were estimated to cost $326,000 or $108 cwt.

The question of power distribution was handled by Paul Triplett, assisted by Herbert Vanderlip of Allis-Chalmers Mfg. Co.

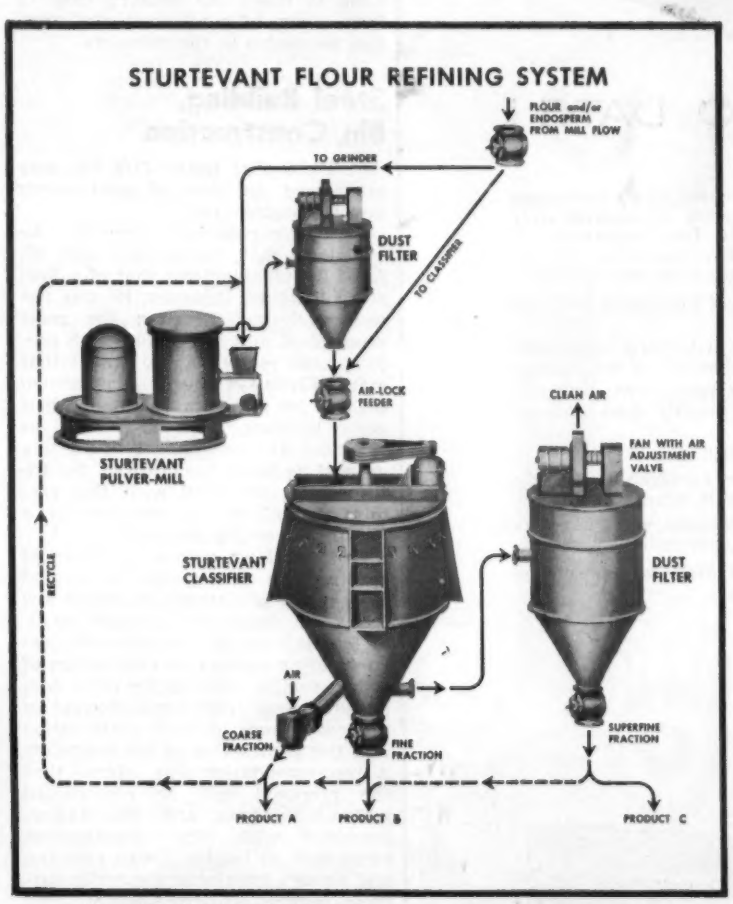
## Concrete Building, Bin Construction

The size of the mill, as designed by the AOM committee, had been set at 406,000 cu. ft. and Ed. Brackney, Weitz-Hettelsater, was given the task of making a cost assessment for the building, using concrete.

His figure was $490,000, giving an average cost of just over $1.20 cu. ft. That figure included some heating equipment, but no boiler room, he pointed out. And he did not include any lighting or piping, except that for heating. But he threw in a boiler.

Henry Schipke


# New Sturtevant Flour Refining System is Highly Flexible, Makes Precise Separations




Key to the Sturtevant Refining System shown above is a Sturtevant Air Classifier which can produce 3 kinds of flour in one operation. Both the Pulver-Mill and the Air Classifier have exceptionally large capacities.

***For protein shifts... Primary classifications.. Coarse or fine separations for new end products***

Sturtevant's new flour refining system is the result of 44 years of experience engineering classification systems for food and other industries.

Heart of the special system is a Sturtevant Air Classifier which classifies coarse, fine and superfine fractions. Low volume of air requirements means smaller dust filters. Thus savings in both space and costs are effected.

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Operation of Sturtevant's new flour refining system is highly flexible. The Pulver-Mill and Air Classifier can be used singly or together, in accordance with individual grinding-classifying needs.

**CALL ON STURTEVANT** to help you upgrade your milling system while lowering production costs. Sturtevant Flour Refining Systems offer much higher output capacities than are available elsewhere, yet require only ⅓ as much capital investment.

Write today describing your requirements. A Sturtevant engineer will be happy to make recommendations based on 44 years' successful experience with grinding-classifying problems. Address your letter to *Grain Processing Division, Sturtevant Mill Company, First National Bank Bldg., Fostoria, Ohio.*

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### Controversy Arises

It was here that controversy arose and Mr. Brackney was not slow to criticize the design from the point of view of economic building. He conceded that a long narrow building, as described, was good from the operational and flow angles, but a squarer building would be cheaper. The saving might be as high as 25%, he told the millers.

His plan would meet all insurance, safety and local code requirements, but he had not prepared any figures for workers' quarters, maintenance shop, boiler room or lab, because the requirements here could vary from plant to plant. They might be simple for about $15,000; they might be more detailed and might cost $50,000.

The cost of a building, he stated, depended purely on the prevailing circumstances.

Mr. Brackney used the sliding form type of construction, because this is the best way where a number of bins are involved. And it is also the best for a multi-story building as developed by the AOM experts, he asserted.

In preparing his cost estimates, he had assumed that the mill would be

Ed. Brackney

built on a site having soil of good load-carrying capacity requiring no piles. His calculations were based on soil suitable for 6,000 lb. per square foot. (It was later brought out that 3,000 lb. was the more correct figure in the KC area.)

Footings were designed to take the added load of an identical structure on the one side in case a decision was made later to double the size of the plant. He also explained the work done to make the building easy to keep clean, with all horizontal services accessible to the sweepers.

## Steel Building, Bin Construction

R. M. Kuphal, Butler Mfg. Co., also introduced an area of controversy into his presentation.

In his introductory remarks, he explained that the original mill offered for planning was that of a five-story building. However, he was not convinced that this was the most economical mill to be built with prefabricated materials. He stated that many European journals presented layouts for a two or two and a half story building, describing them as practical and economical to operate as well as being the "mill of the future." He concurred with this premise and offered for consideration a low profile or 2½ story mill.

In describing points in favor of constructing a steel mill, he pointed out several advantages, including low first costs, due in part to much smaller foundations, lighter materials, less engineering as well as elimination of piling usually required for mills constructed near waterways. Second in the advantages of steel construction was the elimination of condensation. A recommendation was offered that the proposed mill be constructed without windows, and this factor, combined with other construction ideas such as insulated wall paneling and smooth interior and exterior surfaces, reduced condensation problems.

Another advantage listed was that of complete flexibility for expanding the construction. Since the recommended construction was that of bolted type framework, no rebuilding would be required and changes in framework would be very inexpensive.

### Low Maintenance Cost

The final factor in economical and practical phases of steel construction was that of low maintenance costs. Mr. Kuphal stated that since steel required relatively little maintenance, costs would be low. Exterior aluminum construction would require less maintenance as well and if galvanized paint were used, repainting would be required around every 5 to 10 years.

In summarizing points still requiring study, he indicated that sanitation might require certain adjustments in construction to match fumigation and other sanitation requirements. Since the seams of the walls would be sealed, some problems might occur, but box section beams were offered as a possible solution. Mention was made that rigid frames would eliminate objectionable trusswork so hard to clean. In the area of insurance, it was explained that metal buildings are classed as fire resistant instead of fireproof. However, available information indicated that steel buildings with open steel flanges have very low insurance rates. Another factor in reducing insurance rates on steel construction would be the use of pneumatic conveying and all metal equipment reducing, if not eliminating, dangers of fires or explosions.

Explanation was made that although the low profile mill would require more pneumatic conveying equipment the additional cost would be more than made up by savings in the foundations alone.

In a presentation of the actual layout of the proposed mill, Mr. Kuphal said that careful consideration of economics involved had led him to recommend a straight roof line for the building, giving it a longer, lower appearance, and utilizing the space so that the tanks were placed alongside the milling machinery.

### Basement Proposed

A gallery, consisting of only a partial floor was proposed for purposes of holding air receivers, air locks, piping and high and low pressure fans. The second floor was designed to contain the sifters and air filters, and the first floor housing the roller mills and purifiers. A partial basement was also proposed for purposes of holding power transmission equipment and piping. The cleaning room in this construction would be located at the head end of the building and the opposite end of the building would include space for offices, locker rooms, freight elevator stairways and bag storage. A warehouse 70 ft. by 80 ft. by 100 ft., without interior posts, would extend from this end of the building.

In describing basic construction and dimensions, Mr. Kuphal stated that the shell of the mill building would be a standard 30 ft. high. Interior floors would be supported by independent columns between rigid frame columns. The second floor would be made of precast concrete slabs covered with 2 in. of poured concrete providing a seal and floor surface. All tanks for milling bins, tempering bins and bulk and mill feed bins would be housed within the building. These bins would all be the same diameter and height and constructed of epoxy coated steel or aluminum of completely welded construction. Each tank would be completely assembled at the manufac-

R. M. Kuphal

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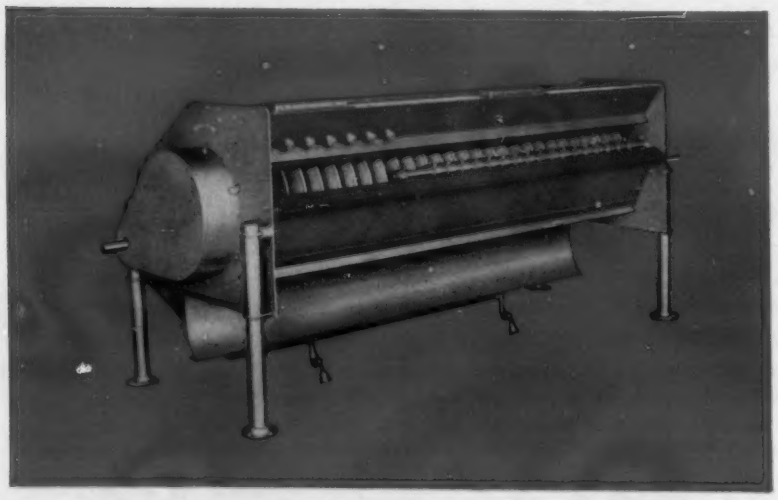

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turing plant and trucked to the mill site.

Roof panels would be left off over tank area and installation could be achieved by use of a crane. In this way, he indicated, one tank could be completely installed in one hour.

Referring to design of the tanks, he said, "There are several advantages to using less than carload, individual bins. The main one being that it provides more bins for blending out carload shipments. Aluminum tanks would have the additional advantage of being maintenance free. Over the years this would amount to a substantial saving."

### Construction Reviewed

In summation, the entire progression of construction was reviewed. The various steps included: Foundation and concrete work progressing and being completed during production period of the steel building; standard steel warehouse shipped and erected first to provide housing for unpacking and storing equipment; structural steel and precast slabs for interior floors erected; structurals for the mill building proper erected; tanks installed on their slab; installation of roofing and side walls; utilities roughed in, concrete surfacing on precast slabs poured, and finally, installation of machinery along with utilities and piping.

Estimated cost of a building of such construction 70 x 160 by 35 feet high was estimated at 50¢ cu. ft. This estimate did not include cost of the utilities. Estimated cost of the standard steel warehouse building was put at under 25¢ cu. ft.

## Machinery Installation

The need for "careful planning" in the installation of machinery was stressed by C. Rudolph Moor, Buhler Mill Engineering Co., in a snappy presentation which was a lesson in the fundamentals of efficiency as a cost saver. Besides careful planning, you must have an experienced supervisor and good cooperation from the erection crews, he said. And they must be men who take pride in their work.

His estimates, he declared, were based on the layout of the AOM mill and it was presumed that the building would be completely finished before the installation crews moved in. His concern here was directed at last minute work by the contractor interfering with the installers.

Detailed erection plans must be drawn up, because the more exact the drawings and the details, the less are the questions likely to arise at the site. As part of the drawings, a list of material must be made with every piece of equipment itemized showing where it is to go.

Instructions to the erection supervisor must be clear and he must have time for study. To rush is useless, Mr. Moor declared. Then the supervisor can give clear instructions to his foremen and crews.

With these points firmly set in the minds of his audience, Mr. Moor proceeded with his estimates.

Installation in the cleaning house and mill proper would involve 18,240 man hours, he declared. Included were two supervisors, one for the cleaning house and screening unit, and one for the mill.

He calculated 6.08 man hours per cwt. and with an average wage of $4 an hour, determined the erection cost at $24.32 cwt.

Mr. Moor said that if it were desired to finish the erection in 12 weeks, two supervisors and 36 men would be needed. But in the case of the AOM building, bearing in mind its shape and size, he felt a smaller crew would be more efficient. The machinery would be hauled-in in two batches in order to conserve working space, and with this in mind he reduced the manpower requirement to 29—two supervisors and 27 men. Erection time would then take 16 weeks.

Insurance changes were handled by George M. Woods, Jr., Factory Insurance Assn. of Chicago. Thereafter, the speakers grouped themselves into a panel and answered questions under the direction of Mr. Gehrig.

The project was an undoubted success and officials were loud in their praise of Mr. Gehrig for the work he had put into the task.

This, then, was how the final figures stacked up for the AOM members after an arduous but valuable session:

### 3,000 Cwt. Mill

| | Total $ | Cwt. $ |
|---|---|---|
| Cleaning ..... | 80,000 | 26.66 |
| Mill ..... | 375,000 | 125.00 |
| Bulk storage, packing flour and feed .... | 126,000 | 42.00 |
| Installation: | | |
| Cleaning and mill.. | 90,000 | 30.00 |
| Storage and packing | 25,200 | 8.40 |
| Electrical: | | |
| Motors, starters, switching, lights.. | 157,850 | 52.60 |
| Concrete building ... | 490,000 | 163.32 |
| Total ..... | 1,344,050 | 448.00 |
| Total + 25% .. | 1,690,060 | 560.00 |

C. Rudolph Moor

## Your Horoscope

### TAURUS

Whether you were born under Taurus, Aries, Leo or a group medical insurance plan . . . you'll find the New MILLER helpful, practical, thorough, reliable, incisive, discerning, comprehensive, alert, lucid, concise and perky.

Watch for it in July!

## New Flour Mill Planned for Sudan

KHARTOUM—A new flour mill is expected to go into operation here late this year. Financed by local Greek and Sudanese interests, and using Italian machinery, it will have a capacity of 75,000 tons of flour a year. This will be sufficient to meet the current requirements in the country.

The mill will be the first in the country. All wheat will be imported in bags, following a decision to abandon plans for bulk handling facilities at Port Sudan on the Red Sea.

—BREAD IS THE STAFF OF LIFE—

## Reclaimed Grain Will Be Sold

HOUSTON, TEXAS—The Navigation District will sell $163,750 worth of grain to two private firms.

The Port Commission recently approved the sale of 50,000 bu. wheat to H. A. Mills Grain Co. for $107,750 and 50,000 bu. milo to Cargill, Inc., for $56,000.

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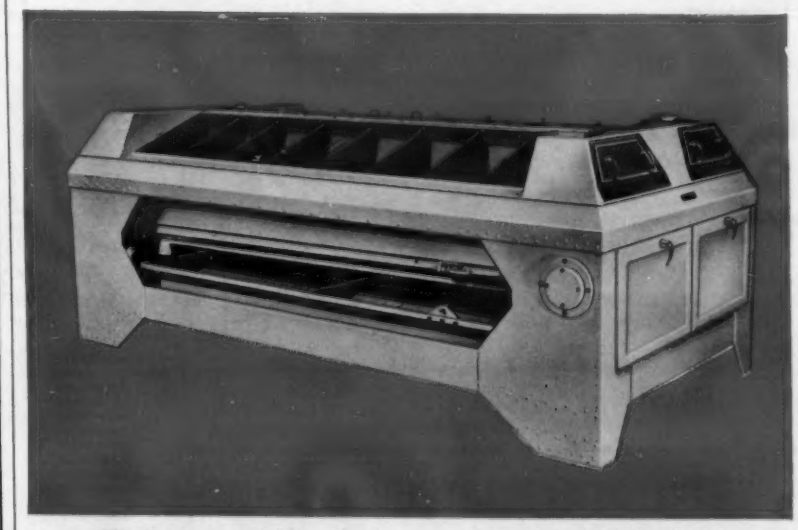

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## No. 2193—Day Dust Separator

The Day Co. has issued a detailed bulletin, D-20, covering performance data, installation photos, selection and dimension charts for Dual-Clone dust separators and Dual-Clone supports. Day Dual-Clones utilize the basic principles of dust separation by cyclonic action plus patented Day designed internal "skimmers" which produce a two-stage separation within the Dual-Clone Collector. There are no moving parts and units can be furnished in 22 standard sizes to handle air volumes from 250 cfm to 23,750 cfm of air. Multiple groupings handle several systems of dust collection and higher air volumes. For a free copy, check No. 2193 on the coupon, clip and mail.

## No. 2192—Selection, Use of Conveyors

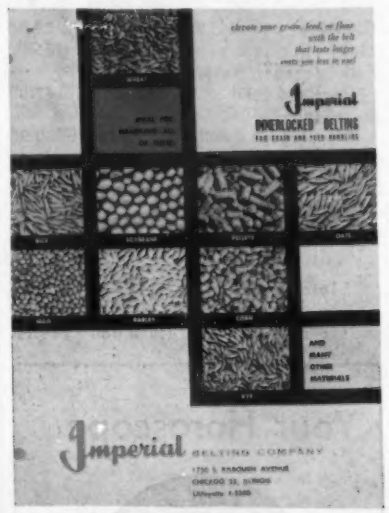
An eight-page report on "Selection of Pneumatic Conveyors," by Howard S. Sayre, manager of its general conveying division, is offered by the Fuller Co. Special sections discuss the three basic systems, the basic elements of each, various component parts, types of conveying lines, valves, indicators and controls. Also discussed are such matters as where to use pneumatic systems, their advantages and the relative costs for investment, power and mechanical maintenance. Fourteen photographs and diagrams are used to illustrate the text. A listing of materials which can be handled pneumatically is included, as well as a capsule history of the last 100 years of pneumatic conveying. For a copy of "Selection and Use of Pneumatic Conveyors," check No. 2192 on the coupon, clip and mail.

## No. 2194—Bulletin Describes Hopper

The "Dribble Reserve Top Hopper," a mechanical device which it is claimed insures accurate grain weighing by providing an absolutely uniform dribble stream, is described in a new bulletin, No. 59-4, now available from the Richardson Scale Co. It is furnished with Richardson's 6-bu. and 10-bu. JJ grain shipping and receiving scales. The illustrated bulletin describes, with diagrams, how a "head" of material is accumulated and fed uniformly into the scale in a completely automatic operation. A full-page set of diagrams outlines a typical arrangement of a 10-bu. JJ grain scale and the dribble reserve top hopper. For a free copy, check No. 2194 on the coupon, clip and mail.

## No. 2196—Brochure Explains Belting

A brochure, with complete information on eight different brands of innerlocked belting for elevating and conveying flour, grain or feed, has been issued by Imperial Belting Co. It shows the brand of belting recommended for best value and top performance in each of the following types of service: Whole grain elevating, conveying and elevating flour and




foodstuffs, pellet and feed elevating, handling of animal fats, oils and acidulous materials, marine leg and manlift elevator service. Information is also given on the correct method of punching elevator belts, ply requirements for bucket projection, washers and special fasteners designed for smooth joining and long-life operation. A free copy can be secured by clipping the coupon, checking No. 2196 and mailing.

## No. 2195—Diverter Valve Described

A diverter valve which can be supplied for either manual or electro-pneumatic operation is now being manufactured by Thomas Robinson & Son, Ltd. The valve has been designed for use in the company's Pneu-Flow pneumatic conveying system, for diverting powdered or granular material in blowing lines. It will be included in both small plants and fully automatic plants of the type which the company is now installing in the U.K. and overseas. The valve can be supplied in various bore sizes, and single solenoid valve with spring returns, or double solenoid valves which can remain in either position indefinitely, are available. An adjustable cushioned end-cap is fitted to valves required for very high speed operation, and a solenoid control valve is also available which allows air to enter the cylinder at a faster rate. For details, check No. 2195 on the coupon, clip and mail.

## No. 2197—Grain Moving Machine

A grain-moving machine—the 3500 Series Vac-U-Vator—featuring more power and greater grain-moving capacity has been developed by Dunbar-Kapple, Inc. Grain can be elevated up

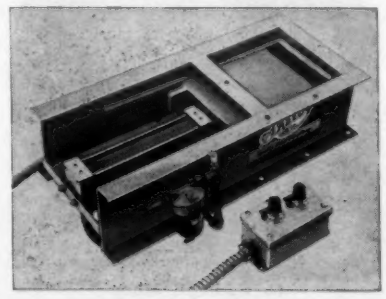
to 100 ft., 20 ft. higher than previous Vac-U-Vators. Grain conveying distances up to 600 ft. can be handled, an increase of approximately 20%. In addition to greater capacity and more power, the new Vac-U-Vator features a lower silhouette. This machine is 18 in. lower than previous models, permitting greater mobility in tight areas. Check No. 2197 on the coupon, clip and mail for details.

## No. 9212—Handbook on Belting

A new handbook on solid woven cotton belting is available from Woven Fabric Belting Manufacturers Assn. The manual gives the standards, characteristics and applications for untreated belting, synthetic rubber impregnated belting and wax or bituminous impregnated belting. Suggestions for better belt care, which, if followed, will result in longer life of belting, are also included. For copies, check No. 9212 on the coupon and mail.

## No. 7940—Air Operated Slide Valve

Remote control of feed and grain mill operation through the use of a newly-developed air-operated slide valve is claimed by the manufacturer, Shelby Manufacturing Co. The valve, designed to fit any conveying system, "assures positive flow control or discharge at any point where automatic



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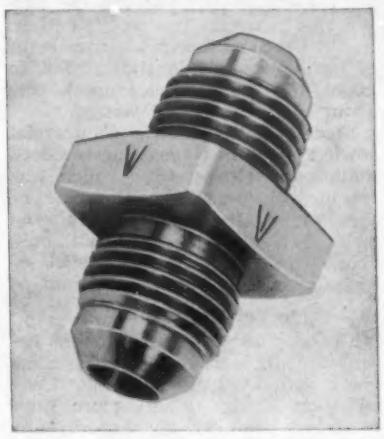
## No. 9185—Pneumatic Check Valve

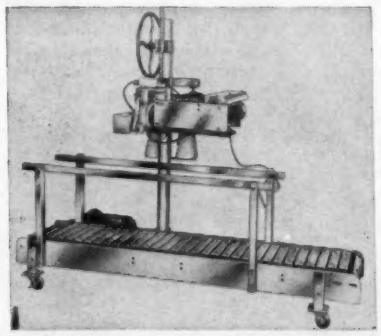
A hydraulic and pneumatic check valve, called the "Quality Seal," has been announced by Quality Control Corp. According to the company it has wide application in all types of hydraulic and pneumatic systems. The valve features a compact design



and is small and light in weight. It is designed to allow full flow at operating pressures up to 3,000 PSI, with a minimum pressure drop, and to provide quick opening and positive closing. A seal ring with a dual seating action is used to guarantee a leak proof valve, the company says. For details, check No. 9185 on the coupon and mail.

## No. 9208—Bag Closing Machine

The Minneapolis Sewing Machine Co. recently introduced an automatic bag closing machine, conveyor Model ASC-100. Once the bag is filled, it is automatically conveyed through the bag feeder, where it trips the automatic starter for the sewing head. After the bag is sewn, the sewing head stops automatically. Threads are



cut both front and back of the closure by the automatic thread clipper. The machine effects a saving in time and labor and eliminates excessive thread waste and wear on the sewing head, report company officials. The unit is 7 ft. long, 5 ft., 6 in. high and 29 in. wide. The conveyor has a speed of 32 ft. per min. The conveyor is mounted on castors for easy portability. The conveyor model is also available without the automatic attachments for those preferring manual operation. Minneapolis automatic attachments can be adapted to any Minneapolis conveyor model now in use. For more information, check No. 9208 on the coupon and mail.

## No. 7956—Scale Bulletin

Cardinal Scale Manufacturing Co. announces the availability of bulletin No. 102, which describes the Cardinal line of suspension hopper scales used for batching, charging, proportioning, filling, compounding and processing. The Cardinal suspension hopper scale lever systems, the company says, are of all steel welded fabrication and can be manufactured to the customer's specifications to be used with an existing or proposed cylindrical, rectangular or square hopper. For copies of the bulletein, check No. 7956 on the coupon and mail.

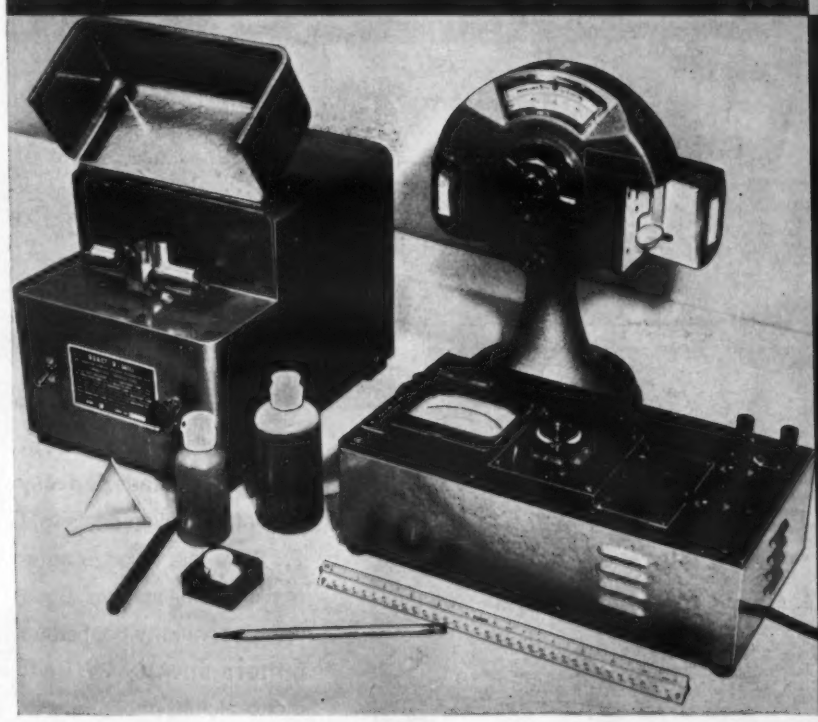
## No. 7974—Bin Drying Floor

A steel supported bin drying floor has been added to the Stormor line of grain storage and drying equipment of Fremont Manufacturing Co. The Channelair perforated floor deck has no bolts in the steel floor supports. The floor is available as a complete unit including the floor, floor supports, perimeter flashing, transition air duct, air entrance panel and closure panel. The floor can also be placed on concrete blocks. For more information, check No. 7974 on the coupon and mail.

## No. 7951—Conveyor Information

Information on two series of conveyors has been released by Chantland Manufacturing Co. A circular describes the A-series aluminum conveyors, and includes specifications, illustrations and pertinent data. An-


test protein on the spot . . .



with this new 5 minute test

High protein means extra money in your pocket . . . but first you've got to find and measure it!

Now you can make your own reliable protein tests in five minutes or less . . . no more days of waiting for laboratory analysis. This means that you can bin your grain or flour by protein percentage *as soon as it's received* . . . blend your incoming shipments for the top resale profit.

This amazing new development, the UDY PROTEIN ANALYZER, introduces a newly discovered principle that now makes possible fast, economical, accurate "on the spot" analysis. You operate it simply without special skills or training.

Whole grain wheat is analyzed by weighing a specific sample and adding a measured amount of a special dye solution which reacts quantitatively with the protein. The sample is then wet milled in the unique React-R-Mill for three minutes. Reaction of the dye with protein is then complete and the remaining unbound dye is merely measured in the color analyzer. This reading is converted directly into protein percentage. Flour is analyzed in the same manner except that milling is unnecessary.

Phone, wire, or write now for further information on increasing your profits with the new UDY PROTEIN ANALYZER. Since production of these units is still limited, your early response may be particularly important.

for full details contact . . .

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UDY ANALYZER COMPANY

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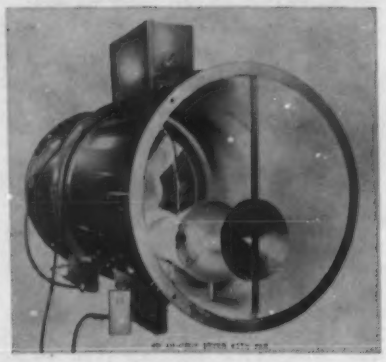
other circular covers the N-series of stationary conveyors. Specifications, illustrations and other important features are included in this circular. For copies, check No. 7951 on the ocupon and mail.

## No. 7952—Grain Dryer

Lennox Industries, Inc., announces a new grain dryer recently added to its line of crop dryers. The supplemental heat unit uses LPG fuel, operates on a 220-volt current for the fan and has a 110-volt control circuit.



Equipped with either a 21 in. or 24 in. fan, the unit (called the GB10) is an economical source of heated air for multiple layer drying of grain in storage bins, the company says. For cool operation, the fan is located upstream from the heat while a humidistat permits economical grain drying, the company states. The burner output range is approximately 75,000-500,000 BTU an hour with the burner being shut off by the humidistat when humidity is low enough for drying without supplemental heat. For more information, check No. 7952 on the coupon and mail.

## Unoccupied Storage Space in Kansas Holds Steady

KANSAS CITY—Total unoccupied grain storage space in Kansas as of June 1 was about the same as a year ago, according to an estimate of the Kansas Crop and Livestock Reporting Service.

The report says total commercial grain storage capacity in the state was 741,078,000 bu. on May 15, and estimates that an additional 5 million bushels will be completed in June, making the state total 746 million.

These facilities held 538,325,000 bu. grain May 15, leaving 202,753,000 bu. empty space for new crop and working area. A year ago the figure was 212,764,000 bu. but because the survey this year was two weeks earlier, it is believed sufficient out movement of grain occurred in that period to make the empty space total now about the same as last year.

Since June 1, 1959, commercial storage space in Kansas increased 66 million bushels, or 10%, which was considerably less than the rate of the gain in the previous two crop years. The report says that only about 5 million additional bushels of space is now under construction.

**Establishments**

The number of grain storage establishments increased to 1,871, compared with 1,823 a year earlier. Construction of new plants more than offset the number abandoned, torn down or destroyed by fire. Included in the 1960 total are 33 terminal elevators and six oilseed crushers. Capacity of plants used for temporary storage at air bases, former army camps, etc., is included in the survey.

Sedgwick County, with 98 million bushels, continues to have the largest grain storage capacity of any Kansas county. Shawnee moved from fifth place to second with 64 million bushels. Saline County was third with 61 million, Reno fourth with 52 million, and Wyandotte fifth with 51 million. These five counties had 44% of the storage space.

——BREAD IS THE STAFF OF LIFE——

## St. Regis Announces First Quarter Sales

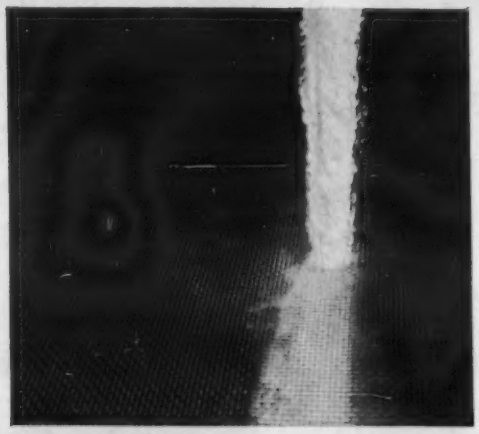
NEW YORK—Stockholders of St. Regis Paper Co. at the annual meeting here were told that net sales in the first quarter of 1960 amounted to $121,997,310, with net earnings at $5,951,696, equal to 60¢ a share on 9,740,596 shares of common stock.

This compared with net sales of $104,244,045 and net earnings of $5,794,081, equal to 63¢ a share on 8,943,219 shares of common in the first three months of last year.

In presenting these figures, William R. Adams, president, stated that the first quarter of this year had seen the establishment of a stable plateau for the orderly development of the growing markets of this decade, rather than the inflation-inspired boom which many predicted would start on precisely Jan. 1, 1960.

Mr. Adams pointed out that the first quarter is frequently the poorest quarter of the year for earnings, and that the company expects progressive improvement through the remainder of the year. On the basis of better results in evidence in April, he voiced the expectation that St. Regis earnings for 1960, on a per share basis, should be 7 to 10% above 1959 results.

With a Bonus in the Bag*



Flow-easy PY-RAN provides ideal leavening for foolproof prepared mixes and self-rising flour. Blends perfectly with other leavening agents . . . flows fast through automatic feeding screens. Good reasons quality-conscious millers specify PY-RAN monocalcium phosphate.

*New bag design instantly identifies its free-flowing PY-RAN . . . and every bag is antislip-treated with Syton for easier handling and stacking.

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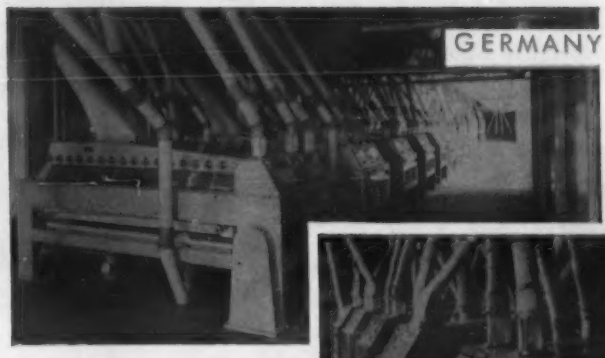
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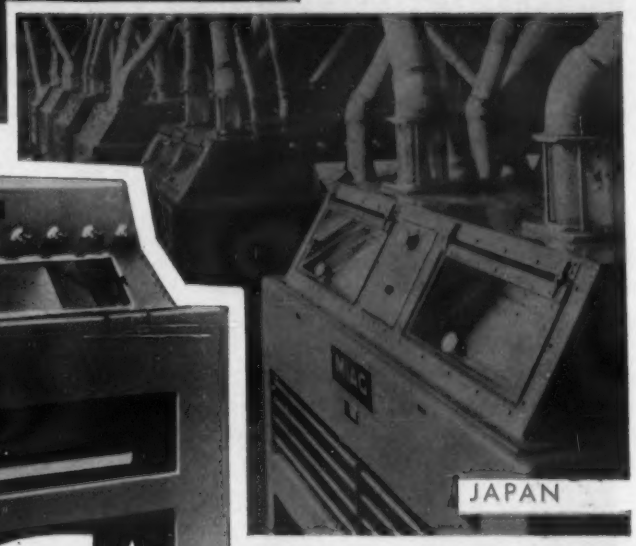
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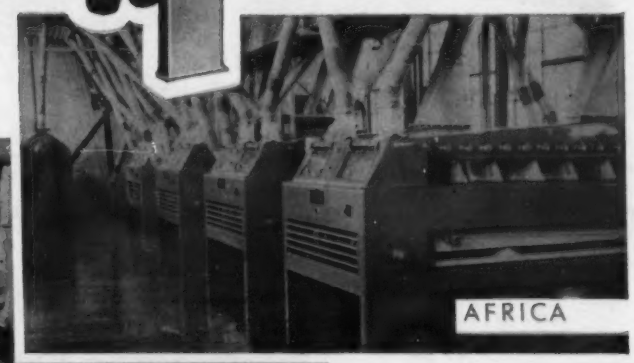
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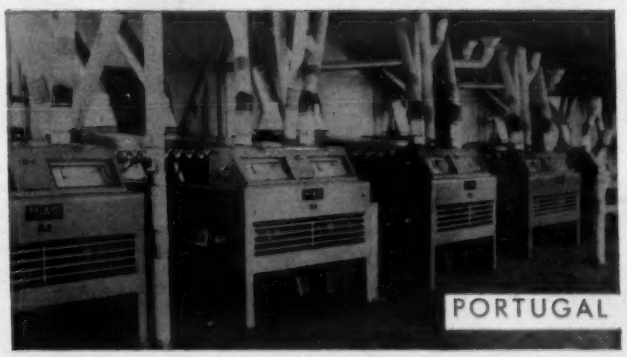
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## NEW ORLEANS PORT REMAINS SECOND

**NEW ORLEANS — The Port of New Orleans retained its rank as the nation's second port in 1959, while port business for the first four months of this year continued to run at high levels, the Port Commission announced. General cargo tonnage across public facilities registered a 37% increase in April over April, 1959, and the increase for the first four months of 1960 was 38% above the same period last year.**

REMEMBER TO ORDER
CHASE BAGS
There's None Better!

## Annual Bag Sewing Contests Scheduled

MEMPHIS, TENN. — American housewives will put nearly 40,000 yd. of cotton fabric that once held 26,000 lb. of feed, flour, and other products to use in a national sewing competition this year.

The event is the 1960 Cotton Bag Sewing Contest, being held at 50 major state and regional fairs. An average of 25 seamstresses are expected to submit eight separate articles in each contest. Since all entries must be sewn from print or plain cotton bags, consumption will total a sizable stack of sacks.

Cash prizes will be awarded to ribbon winners at each fair, and local contestants receiving the greatest number of first-place ribbons will be given portable sewing machines and become automatic finalists. National awards include two expense-paid vacations in Hollywood and a $200 third prize. Top winners also will share in merchandise gifts that range from major household appliances to lifetime supplies of fabric dye.

The Cotton Bag Sewing Contest is an event sponsored annually by the National Cotton Council and the Textile Bag Manufacturers Assn.

**INSPECT MULTIWALL BAG—Guests inspect a multiwall paper bag made at the new 140,000 sq. ft. plant of the Wagner Bag Co., Salt Lake City, during the official opening and plant tour held recently. The new plant was completed in November at about the time the Wagner Co. merged with St. Regis Paper Co. The Utah firm, which has been supplying the inter-mountain states with cotton and burlap bags for almost 50 years, is now also offering multiwall paper bags for feed and other commodities. In the picture are (left to right): J. C. McNeil, The Pillsbury Co., Minneapolis; B. W. Recknagel, vice president and general manager of St. Regis' bag division; E. B. Ellsworth, The Pillsbury Co., Minneapolis, and Robert Quinlan, St. Regis, Minneapolis.**

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(2) Scientifically formed lip aids in greater cup capacity.
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- ☐ Rubber Ball Cloth Cleaner
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**FIRST,** there is the benefit of **STERWIN'S** research. **STERWIN'S** vast research facilities are constantly working to improve existing products and processes and to develop new ones for better, more economical flour treatment.

**SECOND,** a field force of technically trained specialists stands constantly ready to render on-the-spot, at-the-mill service. These specialists, calling on years of broad experience in every phase of flour treatment, answer questions, solve problems, help effect valuable savings in time, money and labor.

Yet these twin benefits carry no price tag. They are contributions which **STERWIN** makes with pride as part of its continuing effort to provide the very finest flour treatment to the millers of the U. S. and Canada.

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- **Easy to install.** Whether you're erecting a new mill or modernizing an old one, BUHLER Pneumatic Systems are easy to install.

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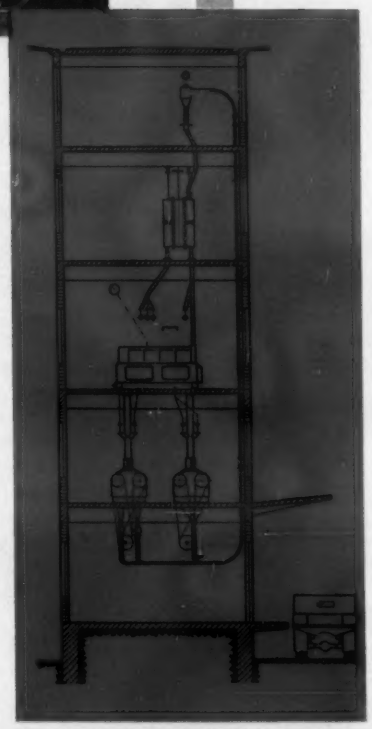
**WRITE TODAY** for more information on Pneumatic Systems. Experienced BUHLER pneumatic specialists will be glad to study your situation and suggest ways you can lower your conveying costs.



Cross section through typical 4-floor mill

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